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Social Life Cycle Assessment

*State of the art and
challenges for supporting
product policies*

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Jo Dewulf, Eckehard Rosenbaum

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5. Positive impacts and Indicator Categories in Social Life Cycle. Assessment. Results from a systematic review.

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5.1 Introduction

The goal of this chapter is to take into account the Social Life Cycle Assessment (S-LCA) methodology, after six years from the publication of the UNEP/SETAC Guidelines in 2009, through the analysis of case studies published between 2006⁷ and December 2014, in order to detect whether positive impacts have been underlined along with negative ones, and the indicators used⁸. In order to better understand this goal, it is useful to define what a social impact and an indicator are. As reported in the Guidelines and Principles for Social Impact Assessment (1994, 107), Social impacts are: "the consequences on human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize themselves so as to meet their needs and generally cope as members of society." From this definition it is possible to better understand what a social positive impact is, and to delve deeper into the purpose of the present study.

The concept of positive impacts arises within the field of Social Impact Assessment (SIA). Vanclay (2003), introduces concepts that stimulate a new vision of Impact Assessment (IA). This is not only seen as a mere methodology aiming at calculating negative impacts, but it also assumes a positive connotation for a proactive and better development of outcomes. As far as indicators are concerned, a clear definition was given by Paragahawewa et al., 2009: "Indicators are 'pointers' to the state of the impact categories (and/or subcategories) being evaluated by the S-LCA". Indicators can be quantitative, semi-quantitative or qualitative.

5.2 Method

A preliminary review of S-LCA case studies was carried by taking into account various papers on theoretical basis of positive impacts: Collaboration for Environmental Evidence 2013, Kitchenham et al., 2007, Chiu & Chu 2012, Chung et al., 2014, Clancy et al., 2013, and Roy et al., 2009. An extended review is reported in Di Cesare et al (2016).

The search engines used were: Google Scholar, Scopus and the inter-database Discovery Service (powered by EBSCO Host) accessed by the University "G. d'Annunzio". The keywords used to conduct the research were as follows: "Social Life Cycle Assessment" AND/OR case study, S-LCA AND/OR case study, "Social LCA" AND/OR case study, Social LCA AND/OR case study, Societal AND/OR LCA case study, "Societal LCA" AND/OR case study, "Societal Life Cycle Assessment" AND/OR case study, Societal Life Cycle Assessment AND/OR case study, Social Life Cycle Assessment AND/OR case study.

The search was performed in both the "title" and the "abstract" fields for the case of the Discovery Service, in the fields of "title" and "topic" for the case of Scopus and in all fields in the case of Google Scholar, for the period from 2006 to December 2014. Papers not pertinent to the topic and those that were not S-LCA case studies⁹ were excluded. At the end of this phase, 40 case studies were considered as relevant.

⁷ Case studies developed through the S-LCA methodology and published before 2009, when this methodology had not yet its official recognition, are available, and are taken into consideration in this paper.

⁸ This paper represents an update and extension of two previous works: the first presented during the 4th International Seminar on S-LCA by Petti et al.,(2014) and the second one presented by Di Cesare et al.,(2014) at Ecomondo, Rimini 2014.

⁹ Including case studies in which social impacts are assessed, but not with the S-LCA methodology.

To better analyse the role of positive impacts in S-LCA, a questionnaire was edited and submitted to the authors of the case studies and to a number of experts in the S-LCA field.

5.3 Results and Discussion

Critical review. The use of the keyword “case study” to perform the research proved to be insufficient since most case studies are integrated in theoretical papers as an application or appendix.

Within the 40 case studies considered, the following were identified: 4 papers on energy sources (3 on bio-fuels and 1 on diesel and petrol), 8 on Information and Communication Technologies, 9 on the agri-food sector and 5 on waste management. The remaining 14 papers can be classified as “Others” because of the diversity of the topics covered.

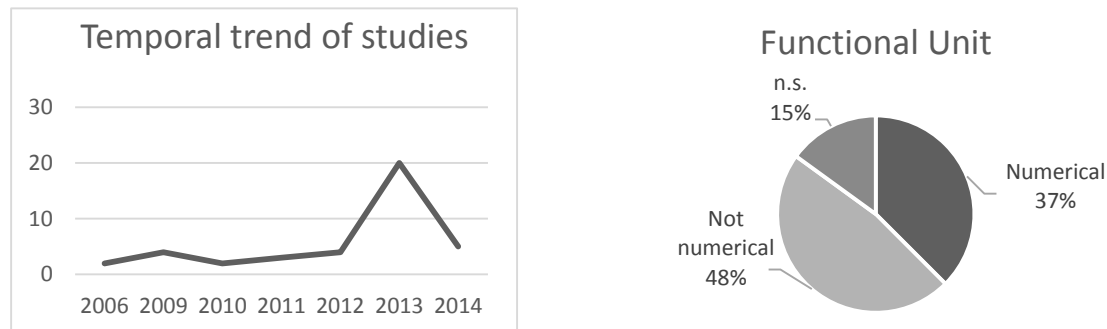


Figure 6 Temporal trend of studies on positive impacts

The temporal trend (Figure 6) shows that during the first years (2006-2008) there was a low number of studies on S-LCA. During this period, the methodology was still in its infancy and no consensus had been reached concerning the performance of a case study. This trend was temporarily interrupted in 2009, when there was a slight increase in the number of studies due to the publication of the UNEP/SETAC Guidelines (2009), which have indeed contributed to the identification of two main characterisation categories: Type1 and Type 2. In 2013, a substantial increase occurred in the number of studies carried out, a sign of growing interest in social issues. In 2014, a dramatic decrease of published studies is registered, perhaps a sign of the methodology still being incomplete and requiring further development. However, there have been two international conferences within 2014, the SETAC Europe 24th Annual Meeting (Basel, 11th-15th May 2014) and the 4th International Seminar on S-LCA (Montpellier, 19th-21st November), where a number of case studies were presented, some of whom were not yet published on scientific journals.

The analysis of the 40 identified papers showed that approximately 72% (29 of 40) of these were conducted in accordance with the UNEP/SETAC Guidelines. This confirms that these have had an essential leverage on the S-LCA research field.

Main methodological issues. Here some of the methodological issues described in ISO 14040 are analysed: Functional Unit (FU), System Boundary and Impact Assessment (IA) methods.

Only 37% of the papers analysed took into consideration a numerical FU, whereas 48% considered a non-numerical FU. The remaining 15% did not state any FU (Figure 6).

Regarding the System Boundary, 35% of the analysed studies (Figure 7) considered the entire life cycle from “cradle to grave”. 25% assessed the life cycle of the product from “cradle to gate” while 28% assessed it from “gate to gate” (e.g. from banana plantations to the port, in Feschet et al., 2013). 7% of the authors did not specify the System Boundary considered in their work. Two papers were categorised as “Other” because of the particularity of the System Boundary considered: Macombe et al., 2013 considered “the national economy” and Paragahawewa et al., 2009 affirmed that “it is appropriate

to focus on all socially significant impacts from both company and production specific activities as per ISO 14044 requirements for E-LCA”.

Regarding the IA phase, 65% of the analysed papers used an IA method in the field of the so-called Taskforce approach, 5% used DALY (Disability-Adjusted Life Year), 5% the Pathways approach, two papers (5% of the total) did not implement any IA. Other two did not specify the IA method used. 15% of the studies analysed were included in the category “Other” in virtue of the peculiarities of the method used (Figure 7).

A weakness in the methodology is pointed out by the tendency of many authors to propose different IA methods. As it is also explained in the UNEP/SETAC Guidelines (2009), the IA methodologies are considered as an open field and further developments of IA methods are greatly needed. To fill this gap an attempt was made by publishing a Handbook on Product Social Impact Assessment by Prè Sustainability in September 2014 (Roundtable for Product Social Metrics 2014).

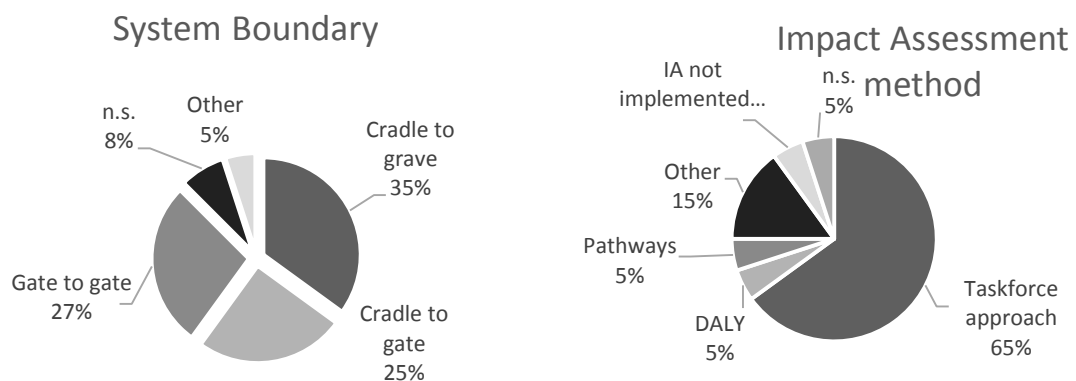


Figure 7 Percentage breakdown of the analysed papers according to the Functional Unit, System Boundary Impact Assessment method considered.

Impact indicators. With regard to the impact indicators, crucial to assess the various social issues of concern (subcategories), they are not specified in about 30% of the total of case studies.

Regarding the need, or not, to set new Subcategories, some disagreement also emerges from the survey conducted among the authors and the experts: i) a part of them claiming new Subcategories to set; ii) another could not say if this is necessary or deemed necessary only in cases where it applies a specific IA method; iii) most believe that the existing Subcategories are sufficient. The definition of new Subcategories would not be, indeed, the best way to identify social impacts, but it would be more interesting to find social impacts on social science literature. It will, therefore, not be necessary to set new subcategories if the relationship (pathway) to assess social impacts is not identified. However, if site-specific assessments are made, more specific categories or indicators may be necessary. For this reason, a specific definition (of what aspects are included) is needed. At the same time, simplification can help in broadening, deepening and implementing of the S-LCA methodology.

Within the analysed papers, the most considered stakeholder category is “Workers”. This could mean that workers are considered by the authors, as the most impacted stakeholder category from a social point of view. The analysis of the papers has shown that some authors use indicators that help to better characterise the context in which a company operates. These are however not present in the Guidelines. These elements are the characteristic indicators of a given sector which would have little meaning if considered within a different context. Other indicators, present in the methodological sheets, are considered less apt to the specific case study developed and are therefore not taken into account.

About 483 indicators were detected (Figure 8): 17% of them are quantitative indicators, 56% are semi-quantitative, and 27% are qualitative (descriptive). This breakdown

should highlight the effort of the authors to express the indicators as quantitative variables.

The UNEP/SETAC Taskforce indicators assess the social context surrounding the unit processes. Some “generic” indicators focus on the average social conditions of sector, country, and region as it is proposed in the Guidelines. Without specifying the social agents responsible for the social conditions observable at the regional and sector-based level, it is clear that the sources of the stressors are not of a technical nature. These are, instead, of an organisational nature and therefore belong to the socio-sphere. Other indicators clearly assess the enterprises, as some are explicitly related to the management practices (Parent et al., 2010).

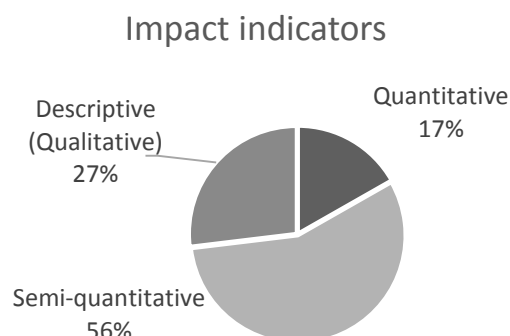


Figure 8 Percentages breakdown of the typologies of indicators considered in the analysed papers.

Almost all indicators are tailored for specific purposes by researchers. Indicators are chosen from a list based on their author’s experience, resulting in heterogeneous lists that differ from one approach to another (Grießhammer et al., 2006).

Regarding positive social indicators, Ekvall (2011) states that the concept of a positive indicator (and of the impacts that it assesses) is related to the concept of freedom. He affirms that it is necessary “to focus on the issue of democracy and distinguish between countries that are free, partly free, or not free” (Ekvall 2011, p. 2). In fact, if a positive indicator is used, it can be measured in terms of “value added” in free countries. “Value added” in partly free countries can then be included in the calculation at half value. If a negative freedom indicator is used, the calculation includes the “value added” in countries that are not free with the addition of the half of the half the “value added” in partly free countries. This approach will describe to what extent the product contributes to economies in countries that are politically free (or not free).

Positive social impacts. One of the problems in dealing with positive impacts is found in the definitional phase. Indeed, the authors interviewed demonstrated low consensus in providing a definition of positive social impact. These definitions are almost perfectly divided between: “The net positive effect of an activity on a community and the well-being of individuals and families” and “An improvement related to the previous situation”, owing to the subjectivity of the issue itself. In any case, saying that a positive impact is not the absence of a negative one was largely agreed upon.

Defining a positive impact as an improvement appears to be vague, because the beneficiary and the duration time are not specified. On the other hand, it is important to underline who the subject of improvement is and who acknowledges it. If it is a top-down improvement, it can concern several Stakeholder Categories, but it may fail to record important changes that occur at a local level (Lahtinen et al., 2014).

In past years, the theme of positive social impacts has been dealt with, for example, by: Norris (2006), UNEP/SETAC (2009), Ekener-Petersen (2013) and Sanchez Ramirez et al., (2014). In particular, the first author refers to “health impacts” (both positive and negative), introducing the concept of positive social impacts. Norris (n.d.) also developed a new approach (called “Handprint accounting”), in which, positive impacts can be directly compared with (and subtracted from) the negative ones.

The analysis of the review shows that 37% of the case studies (13 of 35) do not explicitly identify any positive impact. The remaining 63% was divided per industrial sectors, as shown in Figure 9.

The analysis pointed out that the utility of goods is identified as a positive impact in two papers (Baumann et al., 2013, Ekener-Petersen and Moberg 2013). The utility, in the economic language, is defined as the well-being that a given good or service is able to provide to a person as it is suitable to satisfy a desire or fulfil a need (Treccani 2012). It appears, therefore, somehow significant to consider the utility performed by the good during its use phase as a positive impact. The concept of positive impacts, however, does not refer merely to the utility (benefit from its use), but in a broader sense, to the so called "win-win" situations¹⁰. These solutions improve the condition of the various parties involved.

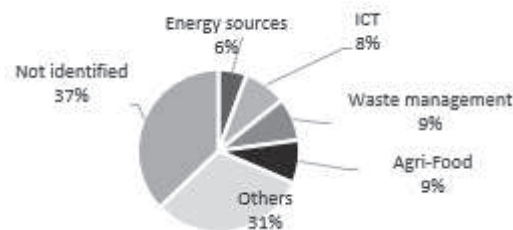


Figure 9 Percentage breakdown of the analysed papers according to the consideration of positive social impacts.

Another interesting consideration regarding positive impacts is made in the paper of Vinyes et al., (2013). The authors claimed that "[n]egative indicators are those whose high values have a negative contribution to sustainability (economic and environmental indicators) and positive indicators are those that have a positive contribution to sustainability (social indicators)".

A noteworthy feature of social impacts is that they produce their effect as soon as there are changes in social conditions. Moreover, it is not only the stakeholders who are subject to these impacts, but they also provoke an active response, implying a certain degree of dynamism. For this reason, they are difficult to identify and are situation/site-specific (Slootweg et al., 2001), triggering a virtuous chain. They refer, in addition, to both quantitative variables (demographic and economic) and to changes in values, belief system and in the perception of the context in which they are produced (Lahtinen et al., 2014). An example of context-related positive impacts is given in the paper of Jørgensen et al., (2010), in which the authors highlight that child labour can be regarded as a positive impact in some situations. These could include: helping children to develop discipline, responsibility, self-confidence and independence, teaching them how to manage money, and providing them with working skills.

5.4 Conclusions

The concept of positive impacts has arisen in the field of Social Impact Assessment (SIA). Indeed, after having performed a literature review and analysed a set of papers, no shared definition of positive social impacts as part of the S-LCA methodology could be deducted. It will be therefore necessary in the future to create a debate about it amongst researchers. As a result of the questionnaires, it should be noted that the unanimity of the authors believe that research in the context of positive impacts is useful for the general advancement on social impacts.

In the framework of social positive impacts (meant as "win-win" situations), helping communities (and other stakeholders) to identify development objectives and ensuring that positive results are maximised. This might be more important than minimising the

¹⁰ A win-win situation is defined as a situation in which all parties involved in the initiative have a benefit in terms of value created in their favour (Molteni 2007).

damage originating from negative impacts. Positive social impacts, in the opinion of the authors, can be regarded as a subjective, context-related issue and have to be assessed as in the case of negative ones (the same category of indicator can display a positive or a negative impact, depending on the previous situation that is set as the reference).

As far as indicators are concerned, it is evident that positive impacts are among the main driving forces towards sustainable development.

There is wide agreement that indicator-sets for the purpose of S-LCA are needed. The Taskforce did not develop a universal indicator-set as a basis for all further S-LCA applications. A universal set of indicators that covers the social aspects in all social, economic and political contexts is considered to be still a challenge.

Future research developments may concern identifying social evaluation criteria to establish what is to be considered as "positive" and deeply understanding the context, for instance: in what way may the context evolve after a change which has led to an improvement occurred?

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